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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/799,486

03/12/2004

Timothy Graham Bradley

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KUNZLER & ASSOCIATES
8 EAST BROADWAY
SALT LAKE CITY, UT 84111

EXAMINER

UHLENHAKE, JASON S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/799,486

Applicant(s)

BRADLEY, TIMOTHY GRAHAM

Examiner

Jason Uhlenhake

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/12/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5, 8, 10, 11, 16, 17, 23 – 25, 29, 30 are rejected under 35

U.S.C. 102(b) as being anticipated by Ikeda et al (U.S. Pat. 6,382,771).

Ikeda et al discloses:

- ***regarding claim 1***, an apparatus for electrorheological printing, comprising: a pressurized ink chamber configured to contain an electrorheological ink, the pressurized ink chamber in fluid communication with a nozzle (Column 3, Lines 15 – 26)
- a stimulator configured to generate a synchronization signal to increase the pressure in the pressurized ink chamber (Column 6, Lines 47 – 54)
- an electrode arrangement configured to create an electric field to control a flow of the electrorheological ink at the nozzle (Column 2, Lines 59 – 62; Column 3, Lines 54 – 63)
- ***regarding claim 5***, the electrode arrangement comprises one or more electrodes (108) circumscribing a portion of the nozzle (110) (Figure 15)
- ***regarding claim 8***, the nozzle is a first nozzle of a plurality of nozzles forming a nozzle array and the electrode arrangement is one of a plurality of electrode

arrangements, each electrode arrangement disposed to control a flow of the electrorheological ink at one of the plurality of nozzles (Column 6, Lines 20 – 25; Column 6, Lines 47 – 54)

- **regarding claim 10**, a print control module configured to receive a print signal (Column 3, Lines 15 – 20)
- a synchronization signal module configured to control the synchronization signal generated by the stimulator (Column 6, Lines 47 – 64)
- an electrode control module configured to synchronize a voltage level at the electrode arrangement with the synchronization signal and the print signal (Column 6, Lines 47 – 64)
- **regarding claim 11**, the electrode control module is further configured to de-energize the electrode arrangement about when the synchronization signal and the print signal are enabled (Column 3, Lines 22 – 33)
- **regarding claim 17**, a computer readable storage medium comprising computer readable code to carry out a method for electrorheological printing (Column 1, Lines 12 – 23)
- pressurizing an electrorheological ink in a ink chamber, the ink chamber in fluid communication with a nozzle (Column 3, Lines 15 – 26)
- generating a synchronization signal, the synchronization signal increasing the pressure in the pressurized ink chamber (Column 6, Lines 47 – 54)
- creating an electric field to control a flow of the electrorheological ink at the nozzle (Column 2, Lines 59 – 62; Column 3, Lines 54 – 63)

- **regarding claim 23**, discharging a drop of the electrorheological ink from the nozzle (Column 3, Lines 1 – 10; Column 6, Lines 57 – 64)
- **regarding claim 24**, comprises de-energizing the electrode arrangement about when the synchronization signal and the print signal are enabled (Column 3, Lines 22 – 33)
- **regarding claim 25**, method further comprises receiving a print signal (Column 3, Lines 15 – 20)
- **regarding claim 29**, method for electrorheological printing, comprising:
pressurizing an electrorheological ink in a ink chamber, the ink chamber in fluid communication with a nozzle (Column 3, Lines 15 – 26)
- generating a synchronization signal, the synchronization signal increasing the pressure in the pressurized ink chamber (Column 6, Lines 47 – 54)
- creating an electric field to control a flow of the electrorheological ink at the nozzle (Column 2, Lines 59 – 62; Column 3, Lines 54 – 63)
- **regarding claim 30**, apparatus for electrorheological printing comprising:
means for pressurizing an electroheological ink in a ink chamber, the ink chamber in fluid communication with a nozzle (Column 3, Lines 15 – 26)
- means for generating a synchronization signal, the synchronization signal increasing the pressure in the pressurized ink chamber (Column 6, Lines 47 – 54)
- means for creating an electric field to control a flow of the electrorheological ink at the nozzle (Column 2, Lines 59 – 62; Column 3, Lines 54 – 63)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (U.S. Pat. 6,382,771) in view of Shibata (U.S. Pat. 6,296,347)

Ikeda et al discloses all of the claimed limitations except for the following:

- ***regarding claim 2***, electrode arrangement comprises a ring electrode pair having a first ring electrode and a second ring electrode
- ***regarding claim 3***, the first ring electrode is connected to a first electrical lead and the second ring electrode is connected to a second electrical lead
- ***regarding claim 4***, the first electrical lead is connected to a reference voltage and the second electrical lead is connected to a power supply, the power supply configured to supply a voltage that is different from the reference voltage
- ***regarding claim 16***, nozzle array defining a plurality of nozzles, each nozzle defining a nozzle volume configured to contain an ink particle (Column 6, Lines 20 – 25)
- electrodes forming a plurality of pairs, each of the plurality of electrodes circumscribing one of the plurality of nozzles and each electrode pair corresponding to one of the plurality of nozzles (Figure 15; Column 6, Lines 20 - 25)

Shibata discloses:

- ***regarding claim 2***, electrode arrangement comprises a ring electrode pair having a first ring electrode and a second ring electrode (Column 2, Lines 60 – 64; Column 5, Lines 29 – 38), for the purpose of incorporating a recording apparatus capable of eliminating unevenness in image density.
- ***regarding claim 3***, the first ring electrode (68) is connected to a first electrical lead (74) and the second ring electrode (70) is connected to a second electrical lead (78) (Figures 5 – 7), for the purpose of incorporating a recording apparatus capable of eliminating unevenness in image density.
- ***regarding claim 4***, the first electrical lead (upper electrode) is connected to a reference voltage (Column 6, Lines 3 – 10) and the second electrical lead (back electrode) is connected to a power supply, the power supply configured to supply a voltage that is different from the reference voltage (Column 4, Lines 54 – 65), for the purpose of incorporating a recording apparatus capable of eliminating unevenness in image density.
- ***regarding claim 16***, plurality of ring electrodes (Column 2, Lines 60 – 64; Column 5, Lines 29 – 38), for the purpose of incorporating a recording apparatus capable of eliminating unevenness in image density.
- power supply connected via at least one electrical lead to one of each of the plurality of ring electrodes in each ring electrode pair, the power supply configured to supply power to the connected ring electrodes, creating an electric field in each nozzle volume at each electrode pair (Column 4, Lines 54 – 65), for the purpose of

incorporating a recording apparatus capable of eliminating unevenness in image density.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of an electrode arrangement comprises a ring electrode pair having a first ring electrode and a second ring electrode; the first ring electrode is connected to a first electrical lead and the second ring electrode is connected to a second electrical lead; the first electrical lead is connected to a reference voltage and the second electrical lead is connected to a power supply, the power supply configured to supply a voltage that is different from the reference voltage; plurality of ring electrodes; power supply connected via at least one electrical lead to one of each of the plurality of ring electrodes in each ring electrode pair, the power supply configured to supply power to the connected ring electrodes, creating an electric field in each nozzle volume at each electrode pair as taught by Shibata into the device of Ikeda et al. The motivation for doing so would have been to incorporate a recording apparatus capable of eliminating unevenness in image density.

Claims 6, 7, 21, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (U.S. Pat. 6,382,771) in view of Kelly (U.S. Pat. 4,364,054)

Ikeda et al discloses all of the claimed limitations except for the following:

- ***regarding claim 6, claim 21***, electrode arrangement is configured to create an electric field to stop the flow of the electrorheological ink in the nozzle

- **regarding claim 7, claim 22**, the electrode arrangement is configured to create an electric field to slow the flow of the electrorheological ink in the nozzle

Kelly discloses:

- **regarding claim 6, claim 21**, electrode arrangement is configured to create an electric field to stop the flow of the electrorheological ink in the nozzle (Column 4, Lines 6 – 20), for the purpose of controlling the flow of ink in the apparatus.

- **regarding claim 7, claim 22**, the electrode arrangement is configured to create an electric field to slow the flow of the electrorheological ink in the nozzle (Column 4, Lines 6 – 20), for the purpose of controlling the flow of ink in the apparatus.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of an electrode arrangement is configured to create an electric field to stop the flow of the electrorheological ink in the nozzle; the electrode arrangement is configured to create an electric field to slow the flow of the electrorheological ink in the nozzle as taught by Kelly into the device of Ikeda et al. The motivation for doing so would have been to control the flow of ink in the apparatus.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (U.S. Pat. 6,382,771) in view of Abe (U.S. Pat. 6,406,133)

Ikeda et al discloses all of the claimed limitations except for the following:

- **regarding claim 9**, the flow of the electrorheological ink at each nozzle of the nozzle array is independently controlled

Abe discloses:

- ***regarding claim 9***, the flow of the electrorheological ink at each nozzle of the nozzle array is independently controlled (Column 14, Lines 9 – 15), for the purpose of improving the quality of printing.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of the flow of the electrorheological ink at each nozzle of the nozzle array is independently controlled as taught by Abe into the device of Ikeda et al. The motivation for doing so would have been to improve the quality of printing.

Claims 12, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (U.S. Pat. 6,382,771) in view of Shima et al (U.S. Pat. 5,801,730).

Ikeda et al discloses all of the claimed limitations except for the following:

- ***regarding claim 12, claim 26***, a pump control module configured to control a pump to control the pressure in the pressurized ink chamber

Shima et al discloses:

- ***regarding claim 12, claim 26***, a pump control module configured to control a pump to control the pressure in the pressurized ink chamber (Column 3, Lines 8 – 18), for the purpose of circulating ink in the apparatus.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of a pump control module configured to control a pump to control the pressure in the pressurized ink chamber as taught by

Shima et al into the device Ikeda et al. The motivation for doing so would have been to circulate ink in the apparatus.

Claims 13, 20, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (U.S. Pat. 6,382,771) in view of Sohn (U.S. Pat. 5,576,747)

Ikeda et al discloses all of the claimed limitations except for the following:

- ***regarding claim 13, claim 20, claim 27,*** a viscosity control module configured to control the viscosity of the electrorheological ink as the electrorheological ink discharges from the nozzle

Sohn discloses:

- ***regarding claim 13, claim 20, claim 27,*** a viscosity control module configured to control the viscosity of the electrorheological ink as the electrorheological ink discharges from the nozzle (Abstract, Column 3, Lines 53 – 59), for the purpose of facilitating control of the ink.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of a viscosity control module configured to control the viscosity of the electrorheological ink as the electrorheological ink discharges from the nozzle as taught by Sohn into the device of Ikeda et al. The motivation for doing so would have been to facilitate control of the ink.

Claims 14, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (U.S. Pat. 6,382,771) in view of Mutou (U.S. Pat. 5,227,814)

Ikeda et al discloses all of the claimed limitations except for the following:

- ***regarding claim 14, claim 28,*** a media compensation module configured to modify the voltage level at the electrode arrangement to compensate for the variation in a speed of a print media on which the electrorheological ink is being printed

Mutou discloses:

- ***regarding claim 14, claim 28,*** a media compensation module configured to modify the voltage level at the electrode arrangement to compensate for the variation in a speed of a print media on which the electrorheological ink is being printed (Column 5, Lines 30 – 48), for the purpose of improving the quality of printing.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of a media compensation module configured to modify the voltage level at the electrode arrangement to compensate for the variation in a speed of a print media on which the electrorheological ink is being printed as taught by Mutou into the device of Ikeda et al. The motivation for doing so would have been to improve the quality of printing.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (U.S. Pat. 6,382,771) in view of Sohn (U.S. Pat. 5,576,747) and Shibata (U.S. Pat. 6,296,347)

Ikeda et al discloses:

Art Unit: 2853

- **regarding claim 15**, a nozzle configured to discharge a drop of ink (Column 3, Lines 15 – 26); an ink having an electrorheological composition (Column 6, Lines 56 – 64)
- electrodes configured to create the electric field to control the rate of discharge of the drop of ink from the nozzle (Column 2, Lines 59 – 67; Column 6, Lines 54 – 63)

Ikeda et al does not expressly disclose the following:

- **regarding claim 15**, ink configured to change viscosity in response to an electric field
- arrangement of ring electrodes

Sohn discloses:

- **regarding claim 15**, ink configured to change viscosity in response to an electric field (Abstract, Column 3, Lines 53 – 59), for the purpose of facilitating control of the ink.

Shibata discloses:

- **regarding claim 15**, arrangement of ring electrodes (Column 2, Lines 60 – 64; Column 5, Lines 29 – 38), for the purpose of incorporating a recording apparatus capable of eliminating unevenness in image density.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of ink configured to change viscosity in response to an electric field; arrangement of ring electrodes as taught by Shon and

Shibata into the device of Ikeda et al. The motivation for doing so would have been to facilitate control of the ink and eliminate unevenness in image density.

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (U.S. Pat. 6,382,771) in view of Minemoto et al (U.S. Pat. 6,224,193)

Ikeda et al discloses:

- ***regarding claim 19***, the electrode arrangement comprises one or more electrodes (108) circumscribing a portion of the nozzle (110) (Figure 15)

Ikeda et al does not disclose expressly the following:

- ***regarding claim 18***, creating an electric field comprises creating voltage difference between a first electrode and a second electrode

Minemoto et al discloses:

- ***regarding claim 18***, creating an electric field comprises creating voltage difference between a first electrode and a second electrode (Column 4, Lines 19 – 33), for the purpose of ejecting from an ejection electrode with reliability and stability.

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to incorporate the teaching of creating an electric field comprises creating voltage difference between a first electrode and a second electrode as taught by Minemoto et al into the device of Ikeda et al. The motivation for doing so would have been to eject from an ejection electrode with reliability and stability.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Uhlenhake whose telephone number is (571) 272-5916. The examiner can normally be reached on Monday - Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JSU
March 7, 2006



 3/8/06
K. FEGGINS
PRIMARY EXAMINER